



US006262833B1

(12) **United States Patent**
Loxley et al.

(10) **Patent No.:** **US 6,262,833 B1**
(45) **Date of Patent:** **Jul. 17, 2001**

(54) **CAPSULES FOR ELECTROPHORETIC DISPLAYS AND METHODS FOR MAKING THE SAME**

(75) Inventors: **Andrew Loxley**, Allston; **Barrett Comiskey**, Cambridge, both of MA (US)

(73) Assignee: **E Ink Corporation**, Cambridge, MA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/413,009**

(22) Filed: **Oct. 6, 1999**

Related U.S. Application Data

(60) Provisional application No. 60/103,364, filed on Oct. 7, 1998.

(51) **Int. Cl.**⁷ **G02B 26/00**; G09G 3/34

(52) **U.S. Cl.** **359/296**; 204/606; 204/450; 345/107; 264/4

(58) **Field of Search** 359/296, 452; 204/606, 450, 456; 345/107, 108; 356/441; 264/4

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,766,478	10/1956	Raley, Jr. et al. .
2,800,457	7/1957	Green et al. .
3,036,388	5/1962	Tate .
3,384,488	5/1968	Tulagin et al. .
3,389,194	6/1968	Somerville .

3,406,363	10/1968	Tate .
3,423,489	1/1969	Arens et al. .
3,460,248	8/1969	Tate .
3,585,381	6/1971	Hodson et al. .
3,612,758	10/1971	Evans et al. .
3,668,106	6/1972	Ota .
3,670,323	6/1972	Sobel et al. .
3,756,693	9/1973	Ota .

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

563 807	7/1975	(CH) .
195 00 694		
A1	8/1996	(DE) .
0 186 710 A1	7/1986	(EP) .

(List continued on next page.)

OTHER PUBLICATIONS

Anders, K., "Monodisperse Droplet Streams and Their Application in Space", Proc. Symp. Fluid Dynam., 1986, pp. 119-125.

(List continued on next page.)

Primary Examiner—Loha Ben

(74) *Attorney, Agent, or Firm*—Testa, Hurwitz & Thibault, LLP

(57)

ABSTRACT

An encapsulated electrophoretic display is made of at least one display element. Each display element includes at least one capsule. The capsule contains at least two substantially immiscible fluids. The first fluid includes an additive, and the second fluid contains a plurality of particles.

24 Claims, 7 Drawing Sheets

